

AMENDMENTS TO THE CLAIMS

1. (Currently Amended) Apparatus for analysing statistical characteristics of an input signal, the apparatus comprising:

a signal input for receiving the signal;

an event detecting unit operatively coupled to the input for detecting events at which the signal level crosses a predetermined level with a predetermined slope;

a combining unit for combining multiple versions of the signal, the versions comprising overlapping parts of said signal and being shifted with respect to each other by amounts corresponding to the spacing of said events, to form a representation of the signal; and

a measuring unit for measuring a parameter dependent upon the shape of said representation and indicative of a statistical characteristic of said signal.

2. (Original) Apparatus as claimed in claim 1, arranged such that signals are deemed to have a predetermined slope if the slope has a predetermined sign.

3. (Previously Presented) Apparatus as claimed in claim 1, the apparatus being arranged to form a first representation in response to detected events of a first predetermined slope, and a second representation in response to detected events of a second different predetermined slope.

4. (Original) Apparatus as claimed in claim 3, wherein the parameter is dependent upon the shape of the combined first and second representations.

5. (Previously Presented) Apparatus as claimed in claim 1, wherein the event detecting unit is operable to detect first and second different types of events, and the combining unit is operable to combine versions of the signal shifted by amounts corresponding to the first type of events in a predetermined manner with versions of the signal shifted with respect to each other by amounts corresponding to the spacing of the second type of events to form said representation.

6. (Previously Presented) Apparatus as claimed in claim 5, including a mode switching unit operable to change said predetermined manner of combination.

7. (Previously Presented) Apparatus as claimed in claim 1, wherein said predetermined level is substantially different from the average level of the signal.

8. (Previously Presented) Apparatus as claimed in claim 1, including a crossing level input for receiving a signal defining said predetermined level.

9. (Currently Amended) An integrated circuit including ~~the~~ an apparatus as claimed in claim 1, for analysing statistical characteristics of an input signal, the apparatus comprising:
a signal input for receiving the signal;
an event detecting unit operatively coupled to the input for detecting events at which the signal level crosses a predetermined level with a predetermined slope;

a combining unit for combining multiple versions of the signal, the versions being shifted with respect to each other by amounts corresponding to the spacing of said events, to form a representation of the signal; and

a measuring unit for measuring a parameter dependent upon the shape of said representation and indicative of a statistical characteristic of said signal,

wherein the integrated circuit further comprising comprises:

a first input terminal for receiving said input signal,

a second input terminal for receiving a threshold signal representing said predetermined level, and

at least one output terminal for providing an output signal forming said representation.

10. (Currently Amended) A method of analysing an input signal, the method comprising detecting events at which the signal level crosses a predetermined level with a predetermined slope,

forming a representation of a combination of multiple versions of the signal, the versions comprising overlapping parts of said signal and being shifted with respect to each other by amounts corresponding to the spacing of the events, and

measuring a parameter dependent upon the shape of the representation.

11. (Original) A method according to claim 10, wherein the parameter is indicative of the degree of resemblance between said shape and the shape of a stored representation.

Claims 12-13. (Canceled)

14. (Currently Amended) ~~The~~ An apparatus-as-claimed-in-claim-13 for analysing statistical characteristics of an input signal, the apparatus comprising:

a signal input for receiving the signal;

an event detecting unit operatively coupled to the input for detecting events at which the signal level crosses a predetermined level with a predetermined slope;

a combining unit for combining multiple versions of the signal, the versions being shifted with respect to each other by amounts corresponding to the spacing of said events, to form a representation of the signal; and

a measuring unit for measuring a parameter dependent upon the shape of said representation and indicative of a statistical characteristic of said signal,

wherein the multiple versions of the signal are time-shifted copies of the input signal,

wherein

the event detecting unit is operable to detect first and second types of events, and

the multiple versions of the signal include a first and second subset, such that

each of the first subset of multiple versions of the signal is time-shifted according to a time instance when one of the first type of events occur, and

each of the second subset of multiple versions of the signal is time-shifted according to a time instance when one of the second type of events occurs, and

wherein the combining unit is operable to

average together trajectories of the first subset of multiple versions of the signal to form a first crosslation function; and

average together trajectories of the second subset of multiple versions of the signal to form a second crosslation function.

15. (Previously Presented) The apparatus as claimed in claim 14, wherein
the first type of event corresponds to time instances when the input signal crosses a predetermined threshold with a positive slope,
the second type of event corresponds time instances when the input signal crosses the predetermined threshold with a negative slope, and
a time-reversibility of a process characterized by the input signal is determinable by comparing shapes of the first and second crosslation functions.

16. (Previously Presented) The method as claimed in claim 10, wherein
the detecting events includes detecting first and second types of events, and
the method further comprises
generating a first subset of the multiple versions of the signal by time-shifting copies of the input signal according to time instances when the first type of events occurs;
generating a second subset of the multiple versions of the signal by time-shifting copies of the input signal according to time instances when the second type of events occurs.

17. (Previously Presented) The method as claimed in claim 16, wherein the forming a representation of a combination of multiple versions of the signals includes:

averaging together trajectories of the first subset of multiple versions of the signal to form a first crosslation function; and

averaging together trajectories of the second subset of multiple versions of the signal to form a second crosslation function.

18. (Previously Presented) The method as claimed in claim 17, wherein the detecting step includes:

detecting the first type of event at time instances when the input signal crosses a predetermined threshold with a positive slope,

detecting the second type of event at time instances when the input signal crosses the predetermined threshold with a negative slope.

19. (Previously Presented) The method as claimed in claim 18, wherein the measuring a parameter includes at least one of:

determining a time-reversibility of a process characterized by the input signal by comparing shapes of the first and second crosslation functions;

determining a minimum sampling interval according to a time interval at which there is a significant difference between at least one of the first and second crosslation functions and the average value of the input signal; and

calculating at least one of a sum and difference of the first and second crosslation functions.

20. (New) Apparatus for analysing statistical characteristics of an input signal, the apparatus comprising:

a signal input for receiving the signal;

an event detecting unit operatively coupled to the input for detecting both first events at which the signal level crosses a predetermined level with a positive slope and second events at which the signal level crosses said predetermined level with a negative slope;

a combining unit for combining multiple versions of the signal, the versions being shifted with respect to each other by amounts corresponding to the spacings between said first events and the spacings between said second events, to form at least one representation of the signal; and

a measuring unit for measuring a parameter dependent upon the shape of said at least one representation and indicative of a statistical characteristic of said signal.

21. (New) Apparatus according to claim 20, wherein said combining unit is operable to form a first representation based on multiple versions of said signal shifted with respect to each other by amounts corresponding to the spacing of said first events and a second representation based on multiple versions of said signal shifted with respect to each other by amounts corresponding to the spacing of said second events.

22. (New) Apparatus according to claim 21, wherein said combining unit is operable to combine said first and second representations to obtain a combined representation, and wherein said measuring unit is arranged to measure a parameter dependent upon the shape of said combined representation.

23. (New) A method of analysing an input signal, the method comprising:
detecting first events at which the signal level crosses a
predetermined level with a positive slope and second events at which the signal level crosses said
predetermined level with a negative slope;

forming at least one representation of the signal by combining
multiple versions of the signal, the versions being shifted with respect to each other by amounts
corresponding to the spacings between said first events and the spacings between said second
events; and

measuring a parameter dependent upon the shape of said at least one representation.

24. (New) A method according to claim 23, wherein said step of forming comprises
forming a first representation based on multiple versions of said signal shifted with respect to
each other by amounts corresponding to the spacing of said first events and forming a second
representation based on multiple versions of said signal shifted with respect to each other by
amounts corresponding to the spacing of said second events.

25. (New) A method according to claim 24, wherein said step of forming comprises forming a combined representation from said first and second representations, and said step of measuring comprises measuring a parameter dependent upon the shape of said combined representation.